



# Interior Forest Health

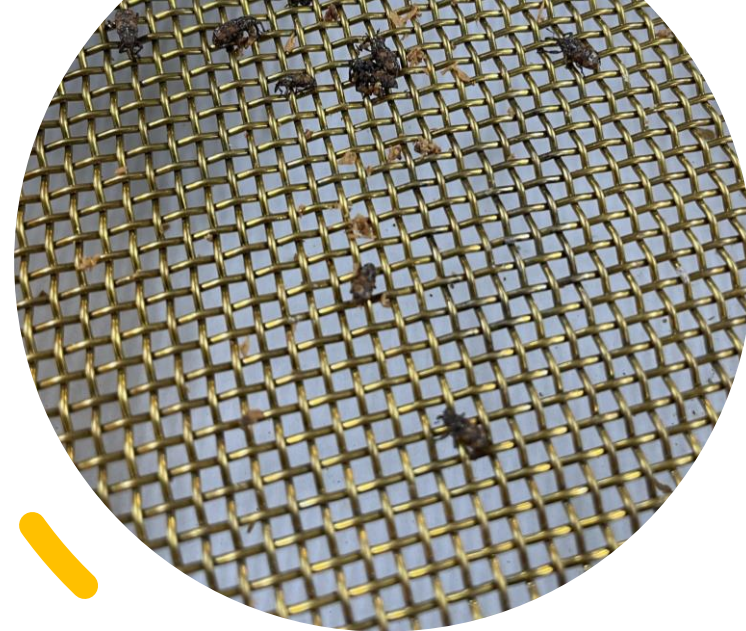
Sebastian Ibarra Jimenez  
Research Scientist, Pest Resistance and Management

BC Ministry of Forests



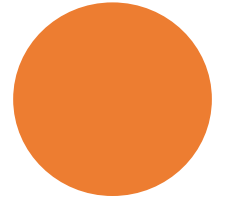
# Current programs

- *Armillaria ostoyae* (Fdi)
  - Artificial inoculations and progeny trials
- *Pissodes strobi* (Sx)
  - Augmentation and field trials
- *Dothistroma septosprum* (Pli)
  - Starting to isolate, partner with Nico Feau (PFC) for ID
  - Develop inoculation methods
- *Cronartium ribicola* (Pa & Pw)
  - Continue intake of 60 Pa families/year, expand *Ribes* garden



# Additions in 2023

- *Endocronartium harknessii* (Pli & Py)
  - Develop and implement isolation and inoculation methods for TBD populations
- *Cronartium comandrae* (Pli)
  - Scouting for field sites to place trials



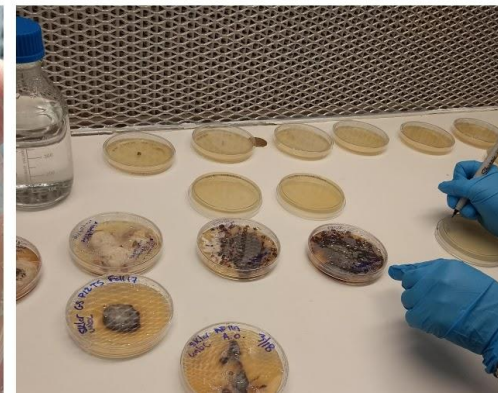
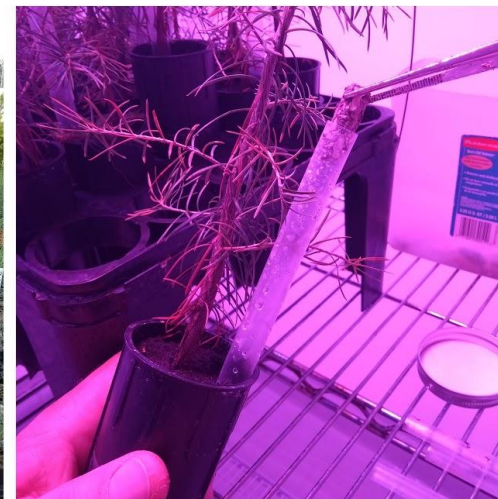


*Armillaria ostoyae*

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# *Armillaria ostoyae* isolation

- Collected & isolated a dozen strains of A.o.
  - Isolates identified to species using ITS and EF primers, as well as mating type
- Archived & actively culturing the strains.
- Cultured select strains on different substrates as inoculum source
  - birch stems
  - birch dowels, with ME
- Inoculated putative R & S families





# *Armillaria* pilot inoculations



- Initial inoculations on 1+0 stock using two substrates:
  - birch dowels
  - birch stems
- assess 1-2 years following infection
- culture easy to grow on dowels, but no successful infections





# *Armillaria* pilot inoculations

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- UPSHOT:
  - birch stems work better than dowels
  - developed scale-up of inoculation material
  - estimated 3 years to observe infection
  - started inoculating small progeny trials, using developed methods (next)
- Plan to expand A.o. isolate collection
  - test pathogenicity of isolates
  - test pathogenicity over time in subculture on artificial media





# *Armillaria* progeny trial inoculation

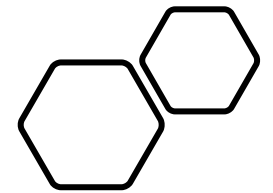
- year1: grow 1+0
- year2: inoculate, grow to 2+0
- year3: plant in field-based trial
- 60 families/year
  - top 2 crosses/parent from pop being evaluated in the field.
  - chosen in circular fashion from factorials -> lots of connection
  - 5 putative resistant, 5 putative susceptible from previous study → linking families to other trials
- 20 reps, 4 blocks, single tree plots
- planted at ONE common location



**Resistance of half-sib interior Douglas-fir families to *Armillaria ostoyae* in British Columbia following artificial inoculation**



*Armillaria* progeny trial planting



# *Pissodes strobi* (Sx)

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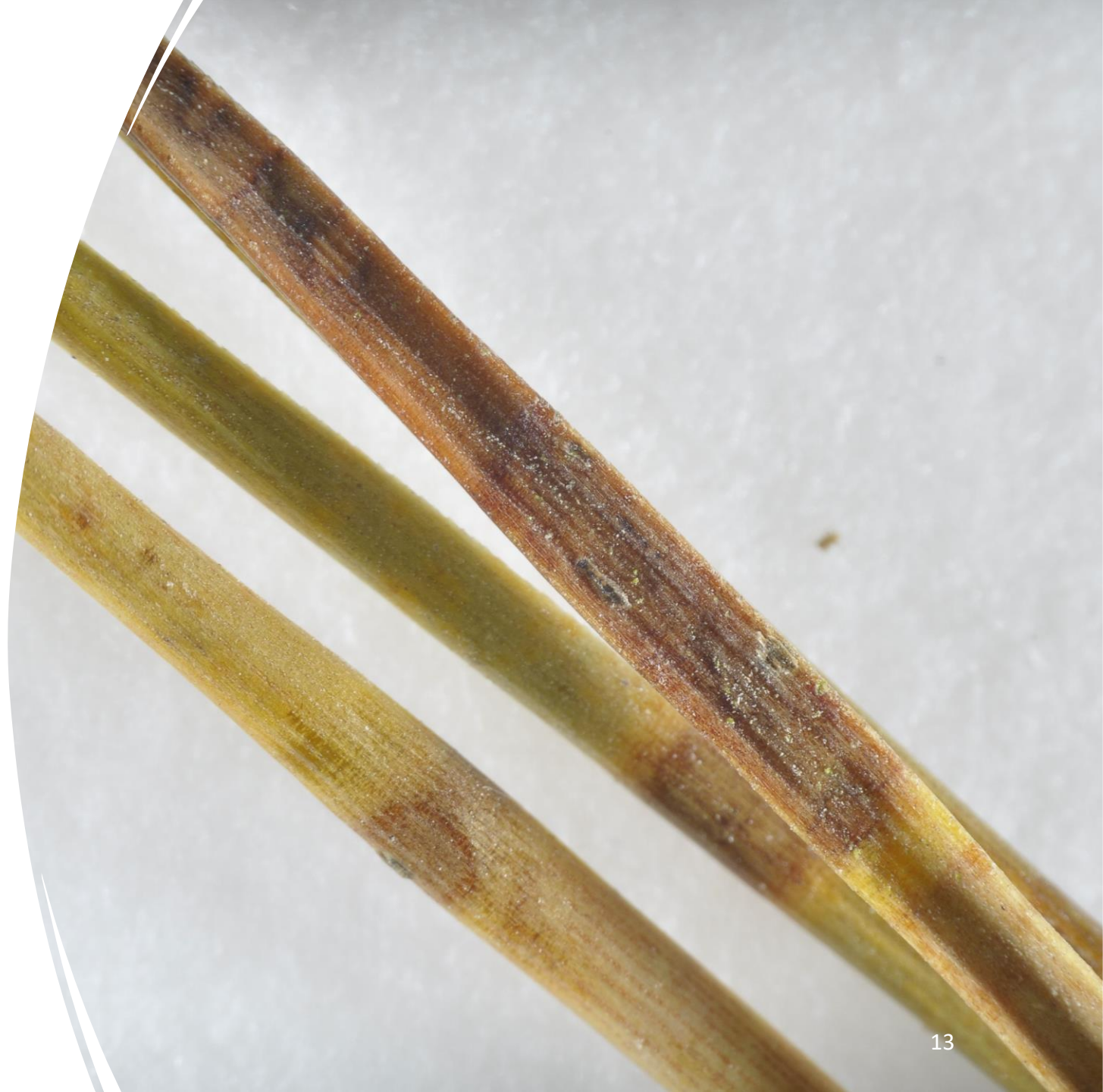
- Receive infested leaders in spring/summer
- Collect emerging adults and rear in artificial diet
- Release in the fall in raised beds
- Assess attack next fall
  
- *Complementary data set from field sites*

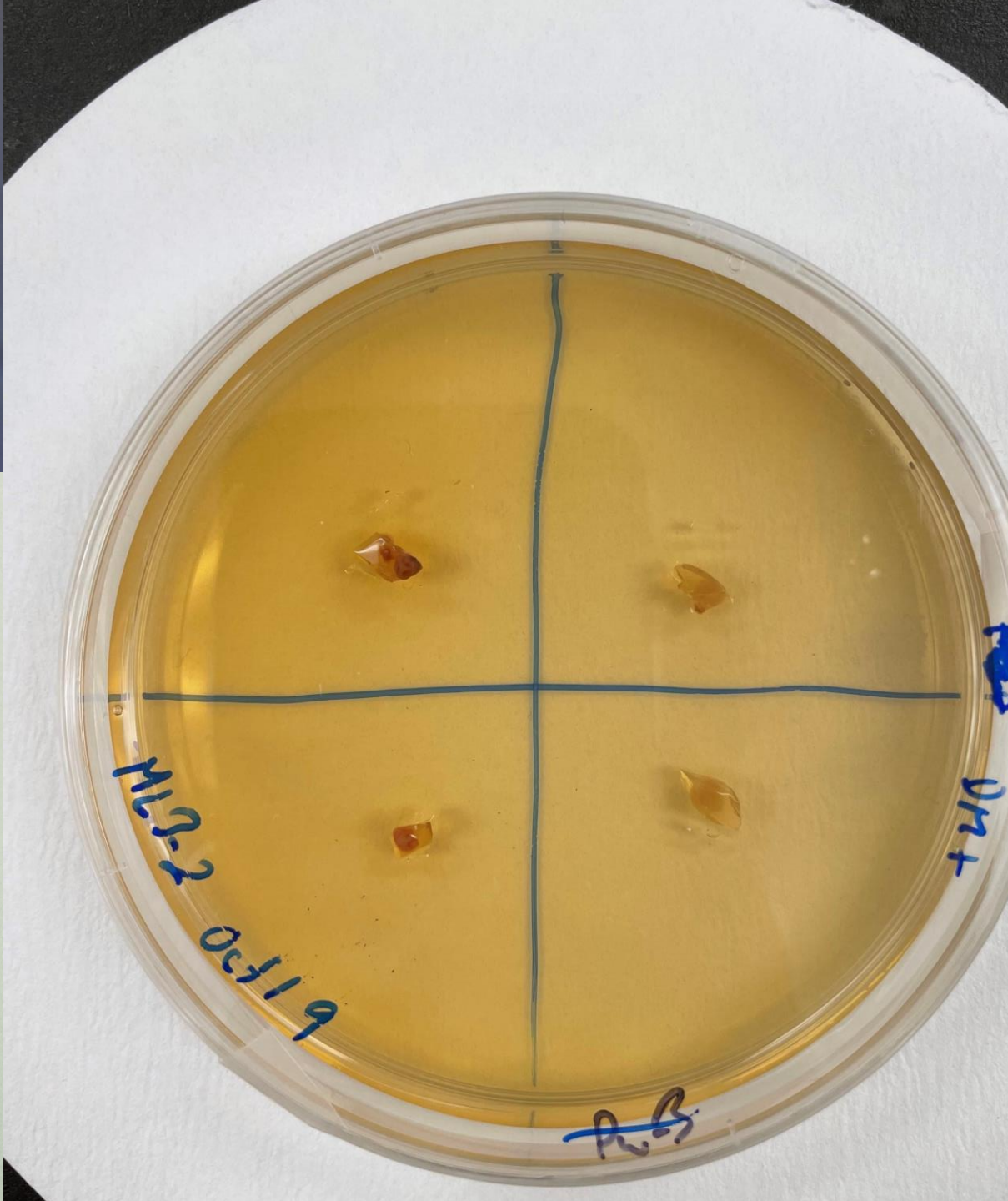
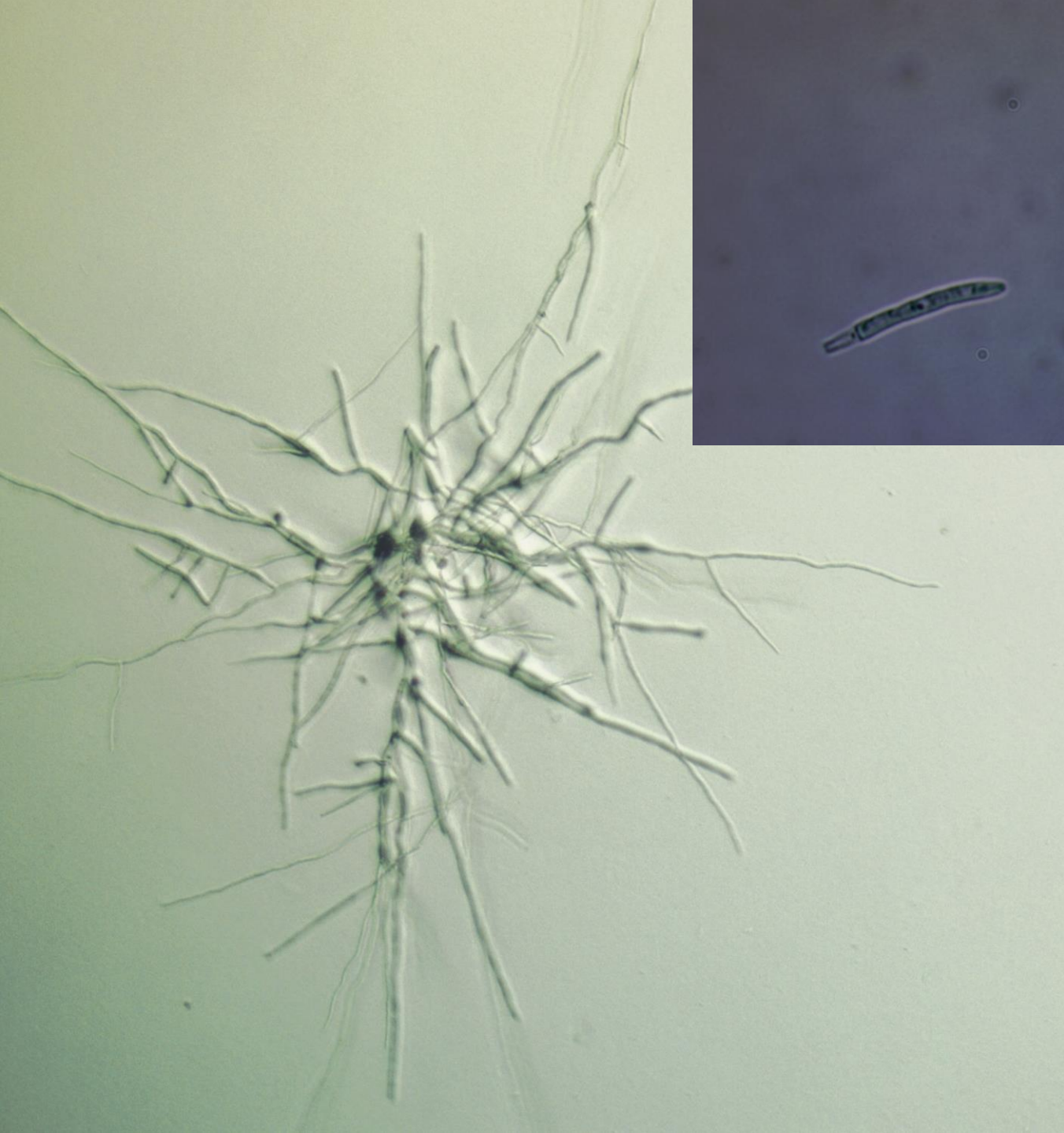


# *Dothistroma septosprum* (Pli)

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- Started isolating material
- Developing culturing and inoculation material





# Pest resistance screening strategies

## Field-based

- more parents evaluated
- longer time (10 years)
- easier to link to growth on landscape
- no guarantee proper disease incidence
- less work



## Artificial

- fewer parents evaluated
- shorter time (3-4 years)
- harder to link to growth on landscape
- good homogeneous infection
- labour intensive



# Thank you

- Trevor Doerksen, MoF
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- Elisa Schulz, MoF
- Serena Lindsay, MoF
- Meredith Levorson, MoF
- Leslie Opatril, MoF
- Alex Woods, MoF
- Nick Ukrainetz, MoF
- Keith Thomas, MoF
- Rebecca Bowler, MoF
- Ward Strong, MoF (Retired)
- Penny May, MoF
- Val Ashley, MoF
- Marie Vance, MoF
- Greg O'Neil, MoF
- Jennifer Taylor, MoF
- Linda Campbell, MoF
- Richard Hamelin, UBC

